

TEST PRODUCT QUALIFICATION REPORT

TITLE:

ADuM3223 and ADuM3224 High Voltage Test
Platform Migration from Harris-Tuvey to MPS

PCN NUMBER:

17_0188

REVISION:

A

DATE: August 25, 2017

SUMMARY

The **ADuM3223 and ADuM3224** are 4 A isolated, half-bridge gate drivers based on Analog Devices, Inc., *iCoupler*® technology. Combining high speed CMOS and monolithic transformer technology, these isolation components provide outstanding performance characteristics superior to alternatives such as optocoupler devices. In accordance with UL and VDE standards these products are being high voltage tested on the Harris-Tuvey test platform in production. This is an aging and limited manufacturing test platform. The proposed change is to add new high voltage test capability using the MPS PD test platform manufactured by MPS Mess-& Prüfsysteme GmbH.

There is no change to the form, fit, function, quality or reliability of product when tested on the new test platform.

This report documents the result of the evaluation done to qualify the MPS PD tester as an additional high voltage test platform for the **ADuM3223 and ADuM3224** product family.

Test product qualification was performed according to Analog Devices Specifications (TST00094/TST00095 – Test Platform Migration Specification).

TEST AND PRODUCT INFORMATION

Devices(Generics):	ADuM3223	ADuM3224
Package:	SOIC_N	SOIC_N
Leads:	16	16
Parts Affected:	ADuM3223ARZ ADuM3223ARZ-RL7 ADuM3223BRZ ADuM3223BRZ-RL7 ADuM3223CRZ ADuM3223CRZ-RL7 ADuM3223WARZ ADuM3223WARZ-RL7 ADuM3223WBRZ ADuM3223WBRZ-RL7 ADuM3223WCRZ ADuM3223WCRZ-RL7	ADuM3224WARZ ADuM3224WARZ-RL7 ADuM3224WBRZ ADuM3224WBRZ-RL7 ADuM3224WCRZ ADuM3224WCRZ-RL7
Current Platform:	Harris-Tuvey with Atrium 5050FHV handler	Harris-Tuvey with Atrium 5050FHV handler
New Platform:	MPS with Atrium VMAX handler	MPS with Atrium VMAX handler

Description and Test Results

The Harris-Tuvey high voltage test platform does not provide data logs for tested units; only a pass or fail result is provided. The MPS test platform provides data logs for leakage current and partial discharge measurements that will be recorded and maintained over time.

The **ADuM3223 and ADuM3224** dual-channel digital isolators are manufactured using the same package, the same transformer technology and on the same high voltage isolation process. The four lots listed below, along with additional test results from multiple products using the 16-lead SOIC_N package, were used to qualify the four generics on the MPS test platform.

Table 1: Shows results of the qualification lot run for the **ADuM3223 and ADuM3224**. The qualification lots have undergone high voltage testing on both Harris-Tuvey and MPS test platforms. Any deviation on the lot qualification run criteria, without further analysis and data to prove a passing qualification, would be considered a failed qualification lot run.

As shown in Table 1, all units that passed on the Harris-Tuvey platform also passed on the MPS platform and all units rejected by the Harris-Tuvey platform were also rejected by the MPS test platform thereby demonstrating correlation of both good and bad units between platforms.

Table 1: Test Product Qualification Lot Run

Generic	Package	Lot number	Lot Size	Good units passed on both test platforms?	Reject units failed on the same test parameter for both test platforms?
ADuM3223	SOIC_N	AN88903.2	100	Yes	Yes
ADuM3223	SOIC_N	AN85160.2	100	Yes	Yes
ADuM3224	SOIC_N	AN89321.2	100	Yes	Yes

Approvals

Product Line Manager
Test Development Manager
Test Product Manager
Quality Manager

Supporting Document

Technical Review Board: TRB# 32640

Additional Information

ADI Homepage:

<http://www.analog.com/en/index.html>

ADI Datasheets:

http://www.analog.com/media/en/technical-documentation/data-sheets/ADuM3223_4223.pdf

http://www.analog.com/media/en/technical-documentation/data-sheets/ADuM3224_4224.pdf

**ADuM3223W_R3 Qualification Results Summary
Automotive Grade 1 Qualification (16L_SOIC_N)**

QUALIFICATION PLAN / STATUS			
TEST	SPECIFICATION	SAMPLE SIZE	RESULTS
High Temperature Operating Life (HTOL)* ²	JEDEC <i>JESD22-A108</i>	9 x 77	Pass
Highly Accelerated Stress Test (HAST)* ¹	JEDEC <i>JESD22-A110</i>	9 x 77	Pass
Temperature Cycle (TC)* ¹	JEDEC <i>JESD22-A104</i>	9 x 77	Pass
Unbiased HAST* ¹	JEDEC <i>JESD22-A118</i>	9 x 77	Pass
High Temperature Storage Life (HTSL) ¹	JEDEC <i>JESD22-A103</i>	6 x 77 3 x 45	Pass
Solder Heat Resistance (SHR)* ¹	JEDEC/IPC <i>J-STD-020</i>	3 x 10	Pass
Latch-Up ¹	JEDEC <i>JESD78</i>	1 x 18	Passed ±200mA @+8.25V / @ +27V
Electrostatic Discharge <i>Human Body Model</i> ¹	ESDA/JEDEC <i>JS-001</i>	3/voltage	Passed ±3000V
Electrostatic Discharge <i>Field-Induced Charged Device Model</i> ¹	JEDEC <i>JESD22-C101</i>	3/voltage	Passed ±1250V

*Preconditioned per JEDEC/IPC J-STD-020

¹Electrical test was performed at Room/Hot/HV First&Last.

²Electrical test was performed at Cold/Room/Hot/HV First&Last

**ADuM3224W_R2 Qualification Results Summary
Automotive Grade 1 Qualification (16L SOIC_N)**

QUALIFICATION PLAN / STATUS			
TEST	SPECIFICATION	SAMPLE SIZE	RESULTS
High Temperature Operating Life (HTOL)* ²	JEDEC <i>JESD22-A108</i>	9 x 77	Pass
Highly Accelerated Stress Test (HAST)* ¹	JEDEC <i>JESD22-A110</i>	9 x 77	Pass
Temperature Cycle (TC)* ¹	JEDEC <i>JESD22-A104</i>	9 x 77	Pass
Unbiased HAST* ¹	JEDEC <i>JESD22-A118</i>	9 x 77	Pass
High Temperature Storage Life (HTSL) ¹	JEDEC <i>JESD22-A103</i>	9 x 77	Pass
Solder Heat Resistance (SHR)* ¹	JEDEC/IPC <i>J-STD-020</i>	3 x 10	Passed
Latch-Up ¹	JEDEC <i>JESD78</i>	1 x 18	Passed ±200mA @+8.25V / +27V
Electrostatic Discharge <i>Human Body Model</i> ¹	ESDA/JEDEC <i>JS-001</i>	3/voltage	Passed ±2500V
Electrostatic Discharge <i>Field-Induced Charged Device Model</i> ¹	JEDEC <i>JESD22-C101</i>	3/voltage	Passed ±1250V

*Preconditioned per JEDEC/IPC J-STD-020

¹Electrical test was performed at Room/Hot/HV First&Last.

²Electrical test was performed at Cold/Room/Hot/HV First&Last